



International Conference



Fostering Cooperation in Energy Efficiency and Accessibility in East Africa

CHALLENGES ON ENERGY ACCESS IN EAST AFRICA



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Outline of the Presentation

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- The East African Community
- Energy Use in EAC
- Policy, Legal and Regulatory Issues
- Energy/Electricity Access in EA countries
- Challenges on Energy Access in East Africa
- Conclusions and Recommendations

East African Community (EAC) Countries

1. Burundi
2. Kenya
3. Rwanda
4. South Sudan
5. Tanzania
6. Uganda



East African Community



Energy Sources for Cooking and Lighting

- Firewood
- Charcoal
- Kerosene
- Electricity

Other sources include: Gas (LPG and recently natural gas) and renewable energy sources

Main Energy Sources for Electricity Generation in EAC Countries

- Hydropower
- Oil
- Natural Gas
- Geothermal Energy
- Solar Energy
- Biomass Energy

Key Energy Institutions in EAC Countries

Type	Burundi	Kenya	Rwanda	Tanzania	Uganda	South Sudan
Energy Regulator	Burundian Regulator for Water and Electricity	Energy Regulatory Commission	Rwanda Utilities Regulation Authority	Energy and Water Utilities Regulatory Authority	Electricity Regulatory Authority	South Sudan Electricity Regulatory Authority
Power Utilities	Water & Electricity Utility for Production and Distribution	Kenya Electricity Generating Company; Kenya Electricity Transmission Company; Kenya Power & Lighting Company	Rwanda Energy Group; Energy Development Corporation Limited; Energy Utility Corporation Limited	Tanzania Electric Supply Company Limited	Uganda Electricity Generation Company; Uganda Transmission Electricity Company Limited	South Sudan Electricity Corporation
Rural Electrification Agency	Rural Electrification Agency of Burundi	Rural Electrification Authority	Rwanda Energy Group/Energy Utility Corporation Limited	Rural Energy Agency	Rural Electrification Agency	Rural Electrification Agency
Ministry	Ministry of Energy and Mines	Ministry of Energy and Petroleum	Ministry of Infrastructure (transport, energy, water and sanitation, urban planning and housing development)	Ministry of Energy and Minerals	Ministry of Energy and Mineral Development	Ministry of Petroleum and Mining

Electricity Access in the EAC Countries

1. Burundi	5%
2. Kenya	60%
3. Rwanda	16%(?) of households 70% by 2018 (commitment)
1. South Sudan	1%
2. Tanzania	46%
3. Uganda	27%

Challenges on Energy Access in East Africa

- Africa as one of the fastest growing economies in the world, and East Africa represents the second-fastest growing region within the continent.
- Africa's power sector is highly underdeveloped and has the lowest electricity access rate on the continent.
- The underdeveloped East African power sector holds great potential.
- East African Power Pool (EAPP), projects require huge investments.
- Access to electricity in six EA countries varies considerably.

East Africa Power Master Plan (EAPMP) envisages long term development power inter-connection of the EAC countries

Energy Sources, Advantages and Challenges in EAC Countries

Energy Source	Advantages	Challenges
Charcoal	<ul style="list-style-type: none"> • Cheap and affordable when bought in bulk • Easily accessible • Easy to use • Economical • Convenient • Lasts longer (when used with improved stoves) 	<ul style="list-style-type: none"> • Illegal logging • Unsustainable production practices • Low use of energy-saving charcoal cooking stoves • Lack of efficient distribution mechanism for improved cookstoves • Lack of effective policies for sustainable charcoal production
Natural gas/ LPG	<ul style="list-style-type: none"> • Quick and efficient • Easy to use • Clean • Does not produce smoke • Economical • Mostly available • Can be used for both lighting and cooking 	<ul style="list-style-type: none"> • Sale of half-filled gas cylinders • Lack of standardized gas cylinders effective distribution channels • Liberalized petroleum sector • Introduction of 6 kg and 3 kg gas cylinders mainly targeting the poor • Introduction of weighing scales at refilling stations
Kerosene	<ul style="list-style-type: none"> • Cheap and affordable when bought in bulk • Easily available • Convenient to use • Low access to electricity • High cost of electricity • Has dual functions of both cooking and lighting • Easy to use 	<ul style="list-style-type: none"> • Shortages of kerosene supply were common • Deregulation of the petroleum industry has seen small-scale kerosene pumping stations opened • Delivering kerosene in a cheaper ways and safer way than kiosks.
Electricity	<ul style="list-style-type: none"> • Cheap and affordable (once upfront costs are paid and if used only for lighting) • Easy and convenient to use Has bright light • Can be used both for lighting and cooking • Quick and efficient • Does not produce smoke 	<ul style="list-style-type: none"> • Illegally tapping electricity from the supply lines exposing user to potential risks • Inefficient use of electricity by not employing energy efficiency and saving measures • Use of energy-saving devices at both household and SME levels, avoiding wastage of electricity and employing energy efficiency measures • Introduction of communal electrification programme

Challenges on Energy Access - Tanzania

- Increased demand for electricity supply and distribution.
- Slow performance to sustain and increase oil and gas exploration.
- Poor regional interconnection.
- High electricity connection and tariff costs compared to the incomes of the expected users.
- Poor infrastructures which lead to failure in reaching rural households.

Challenges on Energy Access - Kenya

- Massive deficit in fuelwood supply leading to high rates of deforestation, resulting in adverse environmental effects such as desertification, land degradation, droughts and famine.
- Lack of access to comprehensive, accurate and reliable information on the renewable energy regulatory landscape which has been a significant barrier to private sector participation on energy coverage.
- Types and number of licenses/clearances, application procedures, associated costs, contacts of related government agencies, expected turn-around time and the sequence of application process remains unclear to many local and international investors interested in the renewable energy subsector.

Challenges on Energy Access - Uganda

- Poverty
- Weak energy policies
- Weak strategies on electrification coverage

Challenges on Energy Access - Rwanda

- Low Access to electricity particularly in the rural areas.
- Costs of new electricity connections are beyond the reach of most households in Rwanda.
- Low connection rate.
- Lack of entrepreneurial capacity in the country, which hampers small commercial electricity projects.
- The increasing population and rising incomes per capita resulting in a higher demand for cooking energy.
- Need to reduce the consumption of biomass (firewood/ charcoal)
- Few and more expensive alternatives such as electricity, LPG and kerosene.

Challenges on Energy Access - Burundi

- Weak regulatory environment.
- Weak institutions at both policy and operational levels.
- Lack of entrepreneurial capacity in the country and this hampers small commercial electricity projects.
- People's poverty.
- Weak plans on energy sector due to country's political imbalance.
- Lack of access of inputs and finance for installation of connections.
- Lack of accurate data on energy supply and demand.
- Lack of maintenance on the transmission and distribution lines.
- Generation facilities need upgrading.
- Overdependence on hydropower, leaving the country vulnerable to rainfall variations.
- Foreign exchange shortages for fuel importation.
- Lack of foreign investors due to political instability.

Challenges on Energy Access - South Sudan

- Lack of Legal and regulatory framework.
- Need to development of human resources capacity.
- Limited access to electricity.
- High electricity tariffs - diesel fuel based production.
- Poor quality and reliability of power supply.
- The lack of electricity supply has been and is still a great challenge to the establishment of industries in South Sudan;
- The lack of funding for power projects.
- High initial and running costs of renewable energy technologies.

Conclusion

- Challenges and access to energy in six EA countries vary considerably.
- Kenya has the highest access rate to electricity at 60% followed by Tanzania at over 46% and Uganda at 27%. Burundi and South Sudan are at the bottom of the list with access rates of 5% and 1% respectively.
- The access to electricity in these countries is due to the low levels of power generation and the insufficient transmission and distribution networks.
- There are inadequate regional interconnections and weak strategies on electricity access and energy policies.
- Slow performance to sustain and increase extraction of modern energy sources such renewable energy, oil and gas remains to be a major challenge.
- Serious efforts have been made by some of the EA countries, to address these challenges and significant achievements have been recorded.
- The existing challenges can be turned into opportunities, thus improving energy access in EAC countries.

Potential Areas of Engagement by HEIs

- Human resource capacity development
- Research
- Technology innovation
- Policy advise
- Technical advise - consultancy
- Public awareness
- Regional and international collaboration

THE END